Allen-Bradley

User Manual for 3000/5000 VA UPS

1609-P3000N	3000 VA 120 VAC
1609-P3000H	3000 VA 208 VAC
1609-P3000A	3000 VA 230 VAC
1609-P5000E	5000 VA 208/230 VAC

Tower/Rack-Mount 3U
Uninterruptible Power Supply

41063-260-01(1) 990-2671 09/2005

INSTALLATION

Read the Safety Instruction sheet before installing the UPS.

Unpacking

Inspect the UPS upon receipt. Notify the carrier and dealer if there is damage.

The packaging is recyclable; save it for reuse or dispose of it properly.

Check the package contents:

- ❑ UPS
- ❑ Front bezel
- ❑ Literature kit containing:
  - ❑ PowerChute® *Business Edition* CD
  - ❑ Bulletin 1609-P Series User Manual CD
  - ❑ *1609-P5000E models only:*
    1609-NMC (Network Management Card installed in slot located in rear of unit)
  - ❑ *1609-P5000E models only:* Network Management Card CD
  - ❑ Serial cable
  - ❑ Quick Start Guide

Environmental Specifications

<table>
<tr><td>TEMPERATURE
OPERATING
STORAGE</td><td>
32° to 104° F (0° to 40° C)
5° to 113° F (-15 to 45 °C) charge UPS battery every six months</td><td rowspan="3">This unit is intended for indoor use only. Select a location sturdy enough to handle the weight.
Do not operate the UPS where there is excessive dust or the temperature and humidity are outside the specified limits.
Ensure the air vents on the front and rear of the UPS are not blocked.</td></tr>
<tr><td>MAXIMUM ELEVATION
OPERATING
STORAGE</td><td>
10,000 ft (3,000 m)
50,000 ft (15,000 m)</td></tr>
<tr><td>HUMIDITY</td><td>0% to 95% relative humidity, non-condensing</td></tr>
</table>

Wiring and Connecting the UPS

CONNECTING UPS USING POWER CORD: 3000 VA UNITS

1609-P3000N – Use captive 8 ft cord. NEMA L5-30 Plug is attached to this cord.

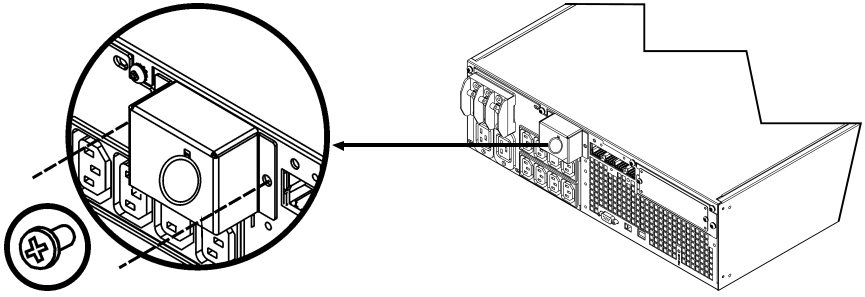
1609-P3000H – Use in captive 8 ft cord. NEMA L6-30 Plug is attached to this cord.

1609-P3000A – User must supply power cord. Power cord must mate with IEC 320 C20 inlet.

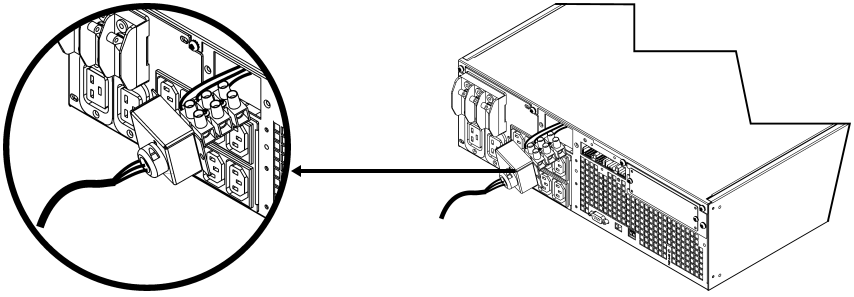
HARDWIRING INSTRUCTIONS: 1609-P5000E

- Wiring must be performed by a qualified electrician.
- Install a high magnetic 30/32 A utility circuit breaker, (Allen-Bradley Catalog Number 1489-A2C300).
- Adhere to all national and local electrical codes.
- Use #10 AWG gauge (5 sq. mm) wire.

1. Switch the utility circuit breaker OFF.
2. Remove the input access panel.
3. Remove circular knockout.



4. Run #10 AWG gauge (5 sq. mm) wire through the access panel, and connect the wires to the terminal block (Green: Ground, Brown: Hot, Blue: Neutral).
   Use an appropriate strain relief (not included).



5. Switch the utility circuit breaker ON.
6. Check line voltages.
7. Replace the access panel.

Connecting the Battery modules and Attaching the Front Bezel

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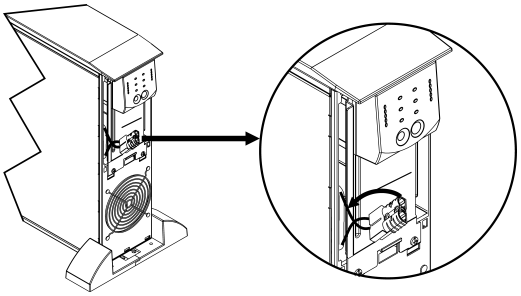

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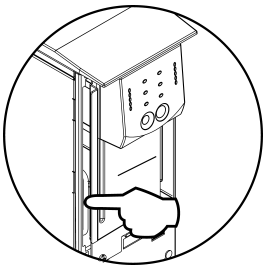

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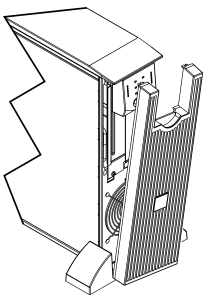

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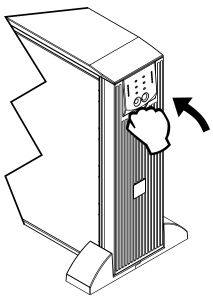
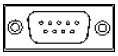
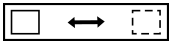
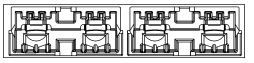


BASIC CONNECTORS

 **serial com**	Power management software and interface cable can be used with the UPS. **Use only a supplied or approved interface cable.** **Any other serial interface cable will be incompatible with the UPS connector.**
 **normal bypass**	Manual bypass enables the user to manually put connected equipment into bypass mode.
EPO terminal	Emergency Power Off terminal allows the user to connect the UPS to the central EPO system.
TVSS screw	The UPS features a transient voltage surge-suppression (TVSS) screw for connecting the ground lead on surge suppression devices such as telephone and network line protectors. **When connecting grounding cable, disconnect the unit from the utility power outlet.**
 **external battery pack connector**	Optional external battery packs provide extended runtime during power outages. These units support up to ten external battery packs.

CIRCUIT BREAKERS

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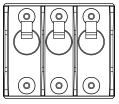
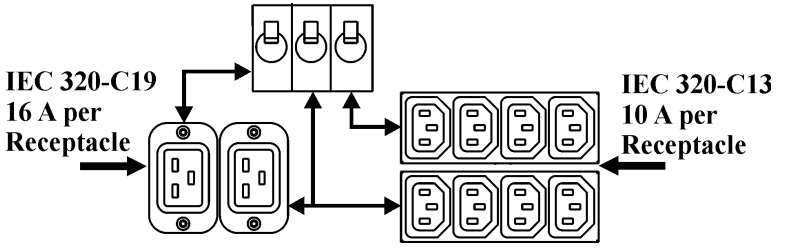
<tr>
<td> 
output circuit breakers
1609-P5000E
1609-P3000A</td>
<td> 
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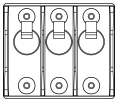
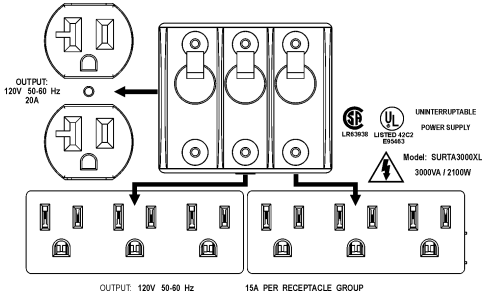
<td> 
output circuit breakers
1609-P3000N</td>
<td> 
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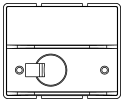
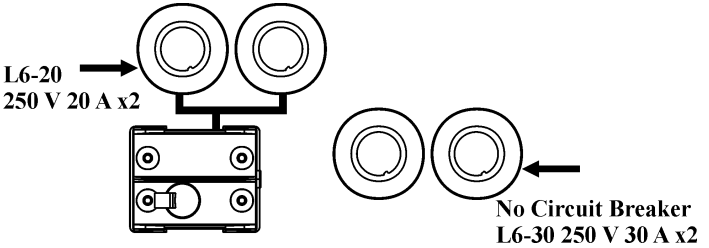
<td> 
output circuit breaker
1609-P3000H</td>
<td> 
</td>
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Connecting Equipment and Power to the UPS

1. Connect equipment to the UPS.
   Avoid using extension cords.
2. Turn on all connected equipment. To use the UPS as a master ON/OFF switch, ensure all connected equipment is switched ON. The equipment will not be powered until the UPS is turned on.
3. To power up the UPS press the

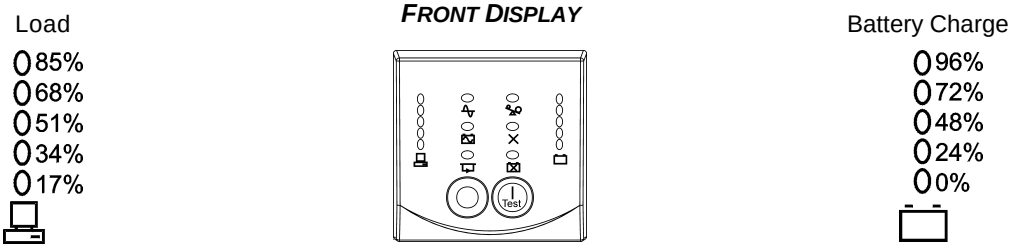
button on the front panel.
   - The UPS battery charges when it is connected to utility power. The battery charges to 90% capacity during the first three hours of normal operation. ***Do not*** expect full battery run capability during this initial charge period.
5. For additional computer system security, install PowerChute® *Business Edition* Smart-UPS monitoring software.

OPTIONS

- ❑ External Battery Pack (1609-PXBP)
- ❑ Rail Installation Kit (1609-PRK1)
- ❑ Isolation Transformer (1609-5000CCT)

OPERATION

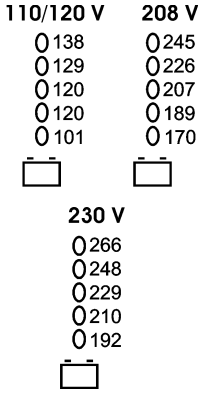
FRONT DISPLAY



Indicator	***Description***
Online	The Online LED illuminates when the UPS is drawing utility power and performing double conversion to supply power to connected equipment.
On Battery	The UPS is supplying battery power to the connected equipment.
Bypass	The Bypass LED illuminates indicating that the UPS is in bypass mode. Utility power is sent directly to connected equipment during bypass mode operation. Bypass mode operation is the result of an internal UPS fault, an overload condition or a user initiated command either through an accessory or the manual bypass switch. Battery operation is not available while the UPS is in bypass mode. Refer to *Troubleshooting* in this manual.
Fault X	The UPS detects an internal fault. Refer to *Troubleshooting* in this manual.
Overload	An overload condition exists. See *Troubleshooting.*
Replace Battery	The battery is disconnected or must be replaced. See *Troubleshooting.*

Feature	***Function***
Power On	Press this button to turn on the UPS. (See below for additional capabilities.)
Power Off	Press this button to turn off the UPS.

Feature	*Function*
Cold Start	When there is no utility power and the UPS is off, press and hold the Test button to power up the UPS and connected equipment. The UPS will emit two beeps. During the second beep, release the button.
Self-Test	**Automatic:** The UPS performs a self-test automatically when turned on, and every two weeks thereafter (by default). During the self-test, the UPS briefly operates the connected equipment on battery. **Manual:** Press and hold the Test button for a few seconds to initiate the self-test.

Diagnostic Utility Voltage 	The UPS has a diagnostic feature that displays the utility voltage. Plug the UPS into the normal utility power. **The UPS starts a self-test as part of this procedure. The self-test does not affect the voltage display.** Press and hold the Test button to view the utility voltage bar graph display. After a few seconds the five-LED, *Battery Charge* display on the right of the front panel shows the utility input voltage. Refer to the figure at left for the voltage reading (values are not listed on the UPS). The display indicates the voltage is between the displayed value on the list and the next higher value.

On Battery Operation

The UPS switches to battery operation automatically if the utility power fails. While running on battery, an alarm beeps four times every 30 seconds.

Press the Test button to silence this alarm. If the utility power does not return, the UPS continues to supply power to the connected equipment until the battery is fully discharged.

When 2 minutes of run time remain the UPS emits a continuous beeping. If PowerChute is not being used, files must be manually saved and the computer must be turned off before the UPS fully discharges the battery.

USER CONFIGURABLE ITEMS

NOTE: SETTINGS ARE MADE THROUGH SUPPLIED POWERCHUTE SOFTWARE, OPTIONAL NETWORK MANAGEMENT CARDS, OR TERMINAL MODE.			
FUNCTION	***FACTORY DEFAULT***	***USER SELECTABLE CHOICES***	***DESCRIPTION***
Automatic Self-Test	Every 14 days (336 hours)	Every 7 days(168 hours), 14 days (336 hours) On Startup Only, No Self-Test	Set the interval at which the UPS will execute a self-test.
UPS ID	UPS_IDEN	Up t o eight characters to define the UPS	Uniquely identify the UPS, (i.e. server name or location) for network management purposes.
Date of Last Battery Replacement	Manufacture Date	Date of Battery Replacement mm/dd/yy	Reset this date when you replace the battery modules.
Minimum Capacity Before Return from Shutdown	0 percent	0, 15, 25, 35, 50, 60, 75, 90 percent	Following a low-battery shutdown, the battery modules will be charged to the specified percentage before powering connected equipment.
Alarm Delay After Line Failure	5 second delay	5 or 30 second delay At Low Battery Never	Mute ongoing alarms or disable all alarms permanently.
Shutdown Delay	20 seconds	0, 20, 60, 120, 240, 480, 720, 960 seconds	Set the interval between the time when the UPS receives a shutdown command and the actual shutdown.
Duration of Low Battery Warning.	2 minutes PowerChute software provides automatic, unattended shutdown when approximately 2 minutes of battery operated runtime remains.	2, 5, 7, 10, 12, 15, 18, 20 minutes	The low battery warning beeps are continuous when two minutes of run time remain. Change the warning interval default to a higher setting if the operating system requires a longer interval for shutdown.
Synchronized Turn-on Delay	0 seconds	0, 20, 60, 120, 240, 480, 720, 960 seconds	The UPS will wait the specified time after the return of utility power before turn-on (to avoid branch circuit overload).
High Bypass Point	+10% of output voltage setting	+5%, +10%, +15%, +20%	Maximum voltage that the UPS will pass to connected equipment during internal bypass operation.

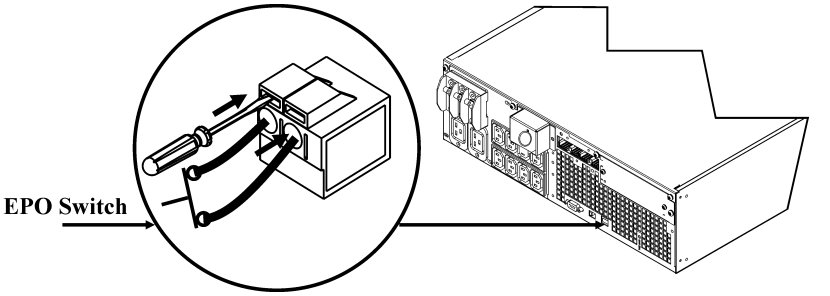
NOTE: SETTINGS ARE MADE THROUGH SUPPLIED POWERCHUTE SOFTWARE, OPTIONAL NETWORK MANAGEMENT CARDS, OR TERMINAL MODE.			
FUNCTION	***FACTORY DEFAULT***	***USER SELECTABLE CHOICES***	***DESCRIPTION***
Low Bypass Point	-30% of output voltage setting	-15%, -20%, -25%, -30%	Minimum voltage that the UPS will pass to connected equipment during internal bypass operation.
Output Voltage	*3 kVA 120 V models:* 120 VAC *208/230 V models:* 230 VAC	*3 kVA 120 V models:* 120 VAC *208/230 V models:* 200, 208, 220, 230, 240 VAC	Allows the user to select the on battery output voltage.
Output Frequency	Automatic 50 ± 3 Hz or 60 ± 3 Hz	50 ± 3 Hz 50 ± 0.1 Hz 60 ± 3 Hz 60 ± 0.1 Hz	Sets the allowable UPS output frequency. Whenever possible, the output frequency tracks the input frequency.
Number of Battery Packs	1	Number of Connected Internal Battery Packs, (two modules per pack)	Defines the number of connected battery packs for proper run time prediction.

Connecting the EPO (Emergency Power Off) Option

The output power can be disabled in an emergency by closing a switch connected to the EPO.

Adhere to National and local electrical codes when wiring the EPO.

Rockwell Automation recommends Allen-Bradley Catalog Number 800F Emergency Stop Operator as the interface to the EPO to connector.



The EPO switch is internally powered by the UPS for use with non-powered switch circuit breakers.

The EPO circuit is considered a Class 2 circuit, (UL, CSA standards) and a SELV circuit (IEC standard).

Both Class 2 and SELV circuits must be isolated from all primary circuitry. Do not connect any circuit to the EPO terminal block unless it can be confirmed that the circuit is Class 2 or SELV.

If circuit standard cannot be confirmed, use a contact closure switch.

Use one of the following cable types to connect the UPS to the EPO switch:

- CL2: Class 2 cable for general use
- CL2P: Plenum cable for use in ducts, plenums, and other spaces used for environmental air.
- CL2R: Riser cable for use in a vertical run in a floor to floor shaft.
- CLEX: Limited use cable for use in dwellings and for use in raceways.
- For installation in Canada: Use only CSA certified, type ELC (extra-low voltage control cable).

Terminal Mode to Configure UPS Parameters

Terminal Mode is a menu driven interface that enables enhanced configuration of the UPS.

Connect the serial cable to the serial com connector on the back of the UPS.

1609-P5000E models only: Remove the 1609-NMC network management card from the slot located in the rear of the unit.

1. **EXIT** the PowerChute *Business Edition* using the following steps:
   - From the Desktop, go to **Start** => **Settings** => **Control Panel** => **Administrative Tools** => **Services.**
   - Select **APC PCBE Server** and **APC PCBE Agent –** right click the mouse and select **Stop.**
2. Open a terminal program. Example: HyperTerminal
   - From the Desktop, go to **Start** => **Programs** => **Accessories** => **Communication** =>**HyperTerminal.**
3. Double-click on the **HyperTerminal** icon.
   - Follow the prompts to choose a name and select an icon. Disregard the message, "...must install a modem," if it is displayed. Click OK.
   - Select the **COM** port that is connected to your UPS. The port settings are:
     - ✓ ***bits per second - 2400***
     - ✓ ***data - bits 8***
     - ✓ ***parity - none***
     - ✓ ***stop bit - 1***
     - ✓ ***flow control - none***
   - Press ENTER
4. Example for setting the number of external battery packs:
   Once the blank terminal window is open, follow these steps to enter the number of battery packs:
   - Press ENTER to initiate terminal mode. Follow the prompts:
     - Press 1 to modify UPS Settings. Press e (or E) to modify the number of battery packs. Enter the number of battery packs, including the internal battery pack (Number of packs: 1= internal battery module,
       2 = 1 external battery pack, 3 = 2 external battery packs, etc.).
       Press ENTER.
     - Follow the prompts.
5. Exit the terminal program.
6. *1609-P5000E models only:* Re-install the 1609-NMC network management card in the slot located in the rear of the unit.

MAINTENANCE, AND TRANSPORT

Replacing the Battery Module

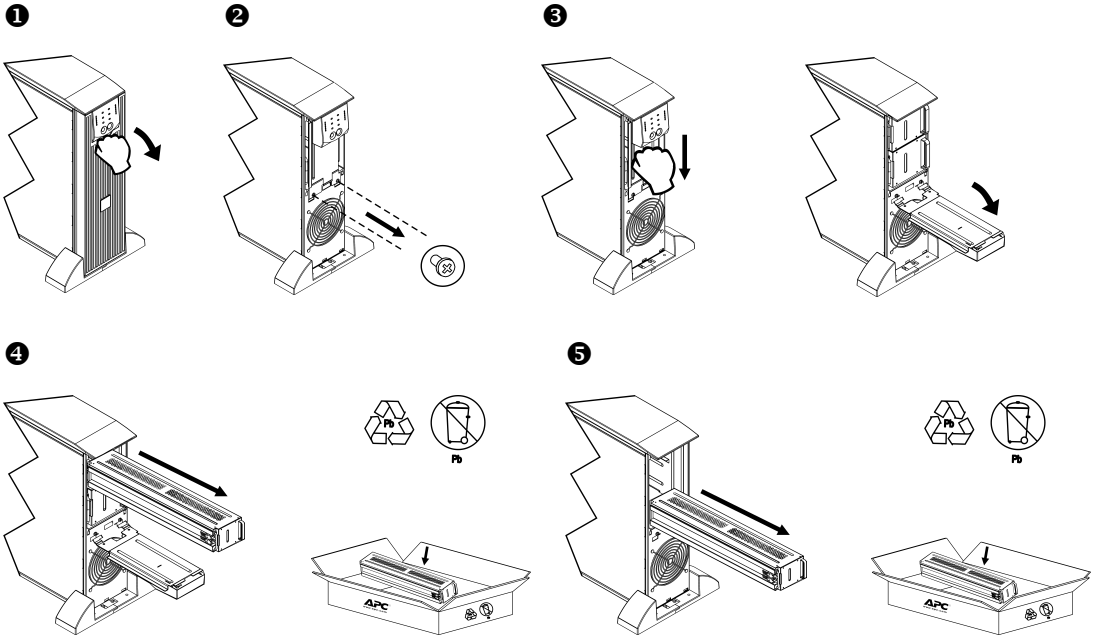
This UPS has an easy to replace, hot-swappable battery module. Replacement is a safe procedure, isolated from electrical hazards. You may leave the UPS and connected equipment on during the procedure.

The battery replacement procedure must include replacing all battery modules in the UPS and connected external battery pack(s).

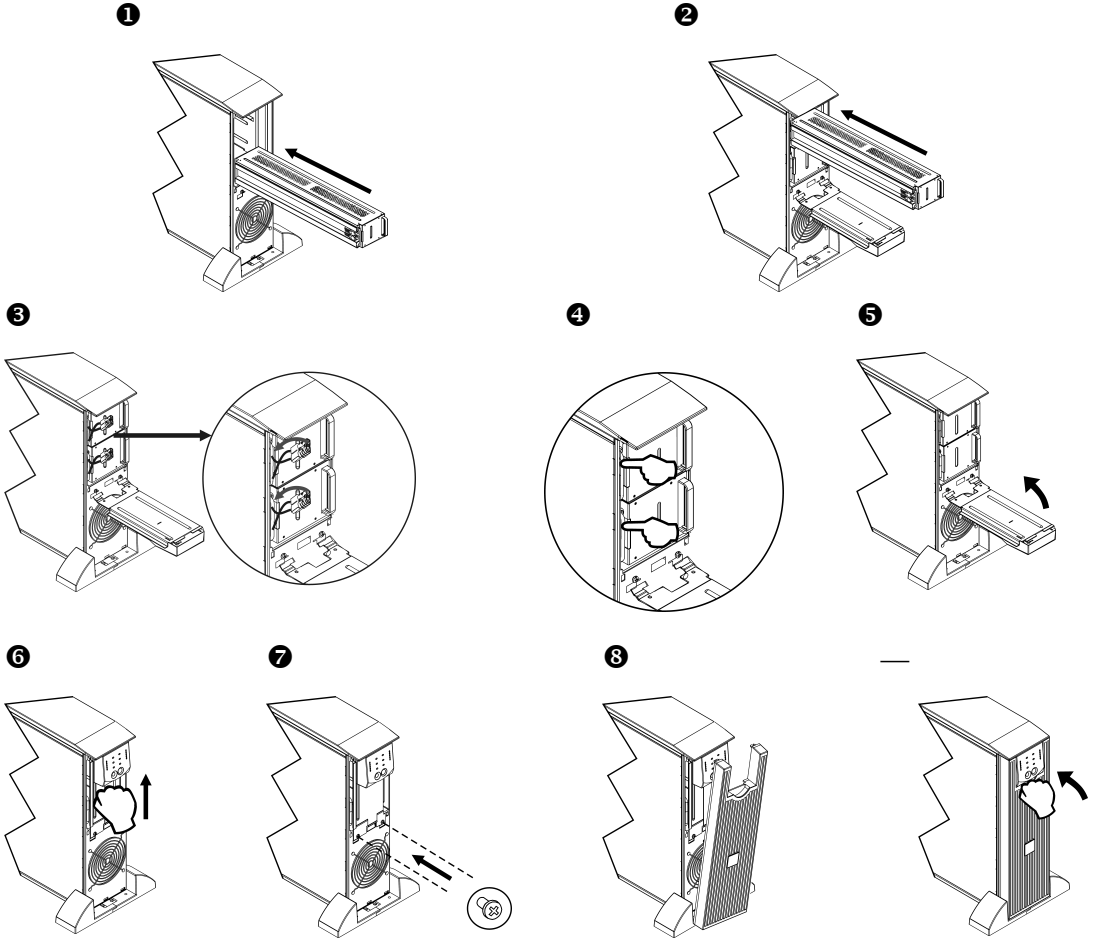
Typical Battery life expectancy is two to four years.

STOP	**Once the battery(s) are disconnected, the connected equipment is not protected from power outages.** **Be careful during battery replacement-the battery modules are heavy.**
Pb Pb	**Be sure to deliver spent batteries to a recycling facility or ship to the manufacturer in the replacement battery packing material.**

REMOVING BATTERY MODULES



REPLACING BATTERY MODULES



Disconnecting the Battery for Transport

Always DISCONNECT THE BATTERY(s) before shipping in compliance with U.S. Department of Transportation (DOT) and IATA regulations.

The battery(s) may remain in the UPS.

1. Shut down and disconnect any equipment attached to the UPS.
2. Shut down and disconnect the UPS from the power supply.
3. Unplug the battery connectors. Refer to *Replacing Battery Modules* in this manual.

TROUBLESHOOTING

PROBLEM AND POSSIBLE CAUSE	SOLUTION
UPS WILL NOT TURN ON	
Battery not connected properly.	Check that the battery connectors are fully engaged.
I Test button not pushed.	Press the I Test button once to power the UPS and the connected equipment.
UPS not connected to utility power supply.	Check that the power cable from the UPS to the utility power supply is securely connected at both ends.
Very low or no utility voltage.	Check the utility power supply to the UPS by plugging in a table lamp. If the light is very dim, have the utility voltage checked.
UPS WILL NOT TURN OFF	
○ button not pushed.	Press the ○ button once to turn the UPS off.
Internal UPS fault.	Do not attempt to use the UPS. Unplug the UPS and have it serviced immediately.
UPS BEEPS OCCASIONALLY	
Normal UPS operation when running on battery.	None. The UPS is protecting the connected equipment.
UPS DOES NOT PROVIDE EXPECTED BACKUP TIME	
The UPS battery(s) are weak due to a recent outage or battery(s) are near the end of their service life.	Charge the battery(s). Battery modules require recharging after extended outages. They wear faster when put into service often or when operated at elevated temperatures. If the battery(s) are near the end of their service life, consider replacing the battery(s) even if the *Replace Battery* LED is not illuminated.
FRONT PANEL LEDS FLASH SEQUENTIALLY	
The UPS has been shut down remotely through software or an optional accessory card.	None. The UPS will restart automatically when utility power returns.
ALL LEDS ARE OFF AND THE UPS IS PLUGGED INTO A WALL OUTLET	
The UPS is shut down and the battery is discharged from an extended outage.	None. The UPS will return to normal operation when the power is restored and the battery has a sufficient charge.
BYPASS AND OVERLOAD LEDS ILLUMINATE, UPS EMITS A SUSTAINED ALARM TONE	
The UPS is overloaded	The connected equipment exceeds the specified "maximum load" as defined in *Specifications* section of the Quick Start Guide. The alarm remains on until the overload is removed. Disconnect nonessential equipment from the UPS to eliminate the overload condition.

Problem and Possible Cause	Solution
BYPASS LED ILLUMINATES	
The bypass switch has been turned on manually or through an accessory.	If bypass is the chosen mode of operation, ignore the illuminated LED. If bypass is not the chosen mode of operation move the bypass switch on the back of the UPS, to the *normal* position.
FAULT AND OVERLOAD LEDS ILLUMINATE, UPS EMITS A SUSTAINED ALARM TONE	
The UPS has ceased sending power to connected equipment.	The connected equipment exceeds the specified "maximum load" as defined in *Specifications* section of the Quick Start Guide. Disconnect nonessential equipment from the UPS to eliminate the overload condition. Press the OFF button, then the ON button to restore power to connected equipment.
FAULT LED ILLUMINATES	
Internal UPS fault.	Do not attempt to use the UPS. Turn the UPS off and have it serviced immediately.
REPLACE BATTERY LED ILLUMINATES	
Replace Battery LED flashes and short beep is emitted every two seconds to indicate the battery is disconnected.	Check that the battery connectors are fully engaged.
Weak battery.	Allow the battery to recharge for 24 hours. Then, perform a self-test. If the problem persists after recharging, replace the battery.
Failure of a battery self-test.	The UPS emits short beeps for one minute and the *Replace Battery* LED illuminates. The UPS repeats the alarm every five hours. Perform the self-test procedure after the battery has charged for 24 hours to confirm the *Replace Battery* condition. The alarm stops and the LED clears if the battery passes the self-test.
UPS OPERATES ON BATTERY ALTHOUGH NORMAL LINE VOLTAGE EXISTS	
Very high, low, or distorted line voltage. Inexpensive fuel powered generators can distort the voltage.	Move the UPS to a different outlet on a different circuit. Test the input voltage with the utility voltage display.
DIAGNOSTIC UTILITY VOLTAGE	
All five LEDs are illuminated	The line voltage is extremely high and should be checked by an electrician.
There is no LED illumination	If the UPS is plugged into a properly functioning utility power outlet, the line voltage is extremely low.
ONLINE LED	
There is no LED illumination	The UPS is running on battery, or it is not turned on.
The LED is blinking	The UPS is running an internal self-test.

Service

If the UPS requires service do not return it to the dealer. Follow these steps:

1. Review the problems discussed in the *Troubleshooting* section of this manual to eliminate common problems.
2. If the problem persists, contact Rockwell Automation Customer Support. Refer to *Contact Information* below.
3. Pack the UPS in its original packaging.
   - Pack the UPS properly to avoid damage in transit. Never use Styrofoam beads for packaging.
   - Damage sustained in transit is not covered under warranty.

Always DISCONNECT THE BATTERY(S) before shipping in compliance with U.S. Department of Transportation (DOT) and IATA regulations.

The battery(s) may remain in the UPS.

Contact Information

Refer to Rockwell Automation at 440-646-5800.

Safety Information - SAVE THIS GUIDE

This Safety Guide contains important instructions that should be followed during installation and maintenance of the equipment and batteries. It is intended for customers who setup, install, relocate, or maintain equipment.
Changes and modifications to this unit not expressly approved could void the warranty.

Handling Safety

<18 kg (<40 lb)

18–32 kg (40–70 lb)

32–55 kg (70–120 lb)

>55 kg (>120 lb)

>10º

⚠*CAUTION! Electrical Safety*

- Do not work alone under hazardous conditions.
- High current through conductive materials could cause severe burns.
- Check that the power cord(s), plug(s), and sockets are in good condition.
- Use qualified service personnel to change the plug on the UPS and to install permanently wired equipment.
- When grounding cannot be verified, disconnect the equipment from the utility power outlet before installing or connecting to other equipment. Reconnect the power cord only after all connections are made.
- Do not handle any metallic connector before the power has been disconnected.
- Connect the equipment to a three wire utility outlet (two poles plus ground). The receptacle must be connected to appropriate branch circuit/mains protection (fuse or circuit breaker). Connection to any other type of receptacle may result in risk of electrical shock.
- *230 V models only:* In order to maintain compliance with the Electro Magnetic Compliance directive for products sold in Europe, output cords attached to the UPS should not exceed 10 meters in length.
- *230 V models only:* Total leakage current from connected equipment and the UPS must not exceed 3.5 mA for a pluggable A Type UPS.

⚠*CAUTION! Deenergizing Safety*

- If the UPS has an internal energy source (battery), the output may be energized when the unit is not connected to a utility power outlet.
- To deenergize a **pluggable UPS,** press the OFF button or switch to shut the equipment off. Unplug the UPS from the utility power outlet. Disconnect the external batteries where applicable and disconnect the internal battery (see User Manual). Push the ON button to deenergize the capacitors.
  To deenergize a **permanently wired UPS,** press the OFF button or switch to shut the equipment off. Switch off the utility circuit breaker that supplies power to the UPS. Disconnect the external batteries where applicable and disconnect the internal battery (see User Manual).

⚠*WARNING! Battery Safety*

- **This equipment contains potentially hazardous voltages**. Do not attempt to disassemble the unit. The **only exception** is for a UPS containing batteries. Refer to the battery replacement procedures detailed in the User's Manual. Except for the battery, the unit contains no user serviceable parts**. Repairs are to be performed only by qualified service personnel.**
- Do not dispose of batteries in a fire. The batteries may explode.
- Do not open or mutilate batteries. They contain an electrolyte that is toxic and harmful to the skin and eyes.
- To avoid personal injury due to energy hazard, remove wrist watches and jewelry such as rings when replacing the batteries. Use tools with insulated handles.
- Replace batteries with the same number and type of batteries as originally installed in the equipment.

Replacement and Recycling of Batteries

See your dealer or contact Rockwell Automation at 440-646-5800, for information on replacement battery kits and battery recycling.

	Be sure to deliver the spent battery to a recycling facility in the replacement battery packing material.

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